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Nuclear Medicine Overview

Nuclear Medicine has been a speciality discipline of medical imaging since the 1950s. In the 1960's an exciting growth of new radiopharmaceuticals allowed physicians to image an expanding variety of organs. Nuclear medicine has been constantly evolving over the past 6 decades.

Nuclear medicine is an advancing diagnostic imaging modality, using targeted organ specific techniques to highlight the molecular process in the tissue of interest. Nuclear Medicine imaging is a painless and safe medical examination, using small amounts of radiation to take images of the organ of interest. It is used to diagnose several pathologies such as cancer, neurological, cardiac, urological and gastrointestinal disorders. Nuclear Medicine differs to Radiological procedures, as in some cases it assesses physiological changes before anatomical structural changes occur.

As we are the only Nuclear Medicine department available to our local community, we provide a number of specialised diagnostic and therapeutic nuclear medicine procedures in a safe, comfortable and welcoming environment (see table on pages 24-25).

Our highly trained staff offer personalised attention to ensure a premium quality, patient-orientated experience. This first class service is extended to you, the referring doctor, ensuring our staff will go beyond compliance to get results to you in an efficient manner, ensuring your complete satisfaction.

For your self-pay or patients with private healthcare cover, we can offer appointments within 48 hours and have results to you within 48 hours of the completion of the procedure. This rapid turnaround reduces the increasing demand on the NHS by reducing waiting times and expenses.

The outcome is your patient can have their results within one week, rather than waiting 2-8 weeks for an appointment in the NHS departments.

We have found that patients do not always wish to travel to Central London for their procedures. This has been due to traffic, congestion charge and lack of parking facilities. At Parkside Hospital and CCL, we offer patients convenient and free parking.

Depending on the type of insurance cover, some insurance companies do not cover the full costs of having procedures in Central London. By attending a reputable local hospital only 30min from Central London, Parkside Hospital and CCL is accessible and affordable.



Equipment

Nuclear Medicine imaging is acquired on a Gamma Camera. It detects gamma photons emitted from the patient's body or organ of interest, from a radiopharmaceutical injection. The gamma camera consists of 2 detectors mounted to a gantry ring, thus not enclosing the patient like MRI. Claustrophobic patients prefer Nuclear medicine procedures in our department over other radiological examinations, because of the open design of the camera and our bright room with a view overlooking the garden.

Organisation of Examination

A request form or letter is required, with the patient's personal details, examination required, a clinical history and indication of why the test is required. You must sign and date the request form.

You can fax the request form to 0208 247 3429 and the nuclear medicine department staff will call your patient and arrange an appointment and inform them of the appropriate preparation for the scan.



Results

Results are not discussed, nor are images given to the patient on the day of the procedure. The examination is reported by our qualified Nuclear Medicine Radiologists daily, and a formal report and images are forwarded to the referring doctor, usually within 24-48hours.

Limitations

Due to the physiological uptake time of the radiopharmaceutical to distribute to the targeted organ, nuclear medicine waiting times can be time consuming. However, due to our location and proximity to Wimbledon Common and Wimbledon Village, patients often take

advantage of the delay period to go for a walk, have a bite to eat, do some boutique shopping or read a book in our beautiful garden.

As we only administer a small amount of radioactivity, our imaging time is much longer than a routine X-ray or CT scans. However, it has been commented on how relaxing our environment is and patients often have a rest or drift asleep during our scans, as they are not noisy like MRI. Procedures need to be booked in advance, usually the day before. Due to the decaying nature of radioisotopes, doses are reconstituted at in the radiopharmacy department of UCLH, in Central London. Doses are delivered to us on a daily basis, and according to demands.

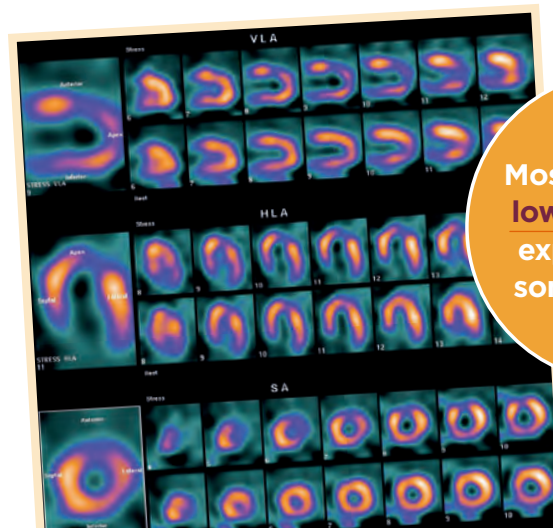
Benefits vs Risks

Benefits:

The physiological information that nuclear medicine examinations can provide is unique and cannot be replicated by any other radiological technique.

It is a safer form of imaging in patients who have suffered from allergic reactions from iodine contrast in previous CT examinations, and patients with metallic implants or pacemakers who cannot be scanned in MRI systems.

Most of our scans have lower radiation exposure than CT scan and most nuclear medicine procedures are only equivalent to less than 2 years natural radiation exposure.



Most scans have lower radiation exposure than some CT scans

Risks and Radiation Concerns:

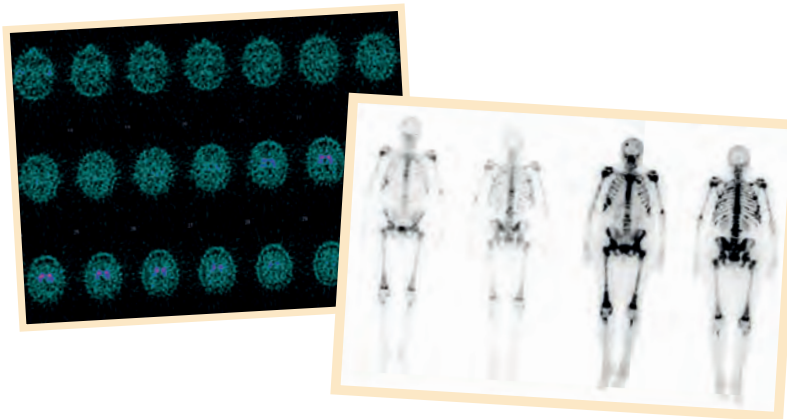
Due to the small amounts of radioactivity administered to the patient, in most cases we do not perform nuclear medicine procedure on pregnant patients, unless the medical benefit of the examination outweighs any potential radiation risk to the foetus.

We can perform scans on breast feeding mothers, however appropriate advice needs to be given as some radiopharmaceuticals can be secreted in to breast milk. Please advise us if your patient is pregnant or breast feeding. Injection of radiopharmaceuticals for diagnostic procedures has been around for over 60 years. To this day, no studies have shown any long term effects from the low dose exposures from nuclear medicine diagnostic imaging.

In most procedures, the radiopharmaceutical injections administered decay away and are excreted via the urinary system over the following

24-48 hour post injection. Although it is possible to have a reaction to the radiopharmaceutical injection, allergic reactions are extremely rare.

Patients can be around children and pets following a radiopharmaceutical injection, but it is advised to minimise prolonged contact for the rest of the day. This is to reduce unnecessary radiation exposure to young children.



SCAN	BREIF DESCRIPTION	TOTAL PROCEDURE TIME	PREPARATION
Whole Body Bone Scan	Assess bone pain, Osteoarthritis, fracture, infection, metastatic disease	4 hours (1 hour scan)	No preparation. Stay well hydrated after injection.
Stay well hydrated after injection			
Liver/Spleen Scan	Assess Liver size, focal uptake, splenunculus post splenectomy	1 hour	No preparation.
MAG3 Renogram	Assess perfusion and excretion, Split function of kidneys	1 hour	Drink 1 litre of water, 1 hour prior to scan.
Gastric Emptying Study	Assess patients with suspected gastroparesis and/or reflux	1 hour 15 min	Fast for 6 hours prior to scan.
Cardiac MUGA scan	Assess Left ventricular Ejection Fraction	1 hour	No preparation.
EDTA Clearance (GFR)	Assess Glomerular Filtration Rate	4 hours	Stay well hydrated after injection.
Hepatobiliary (HIDA) Scan	Assess biliary excretion and gallbladder function	1 hour 40 min	Fast for 6 hours prior to scan.
DaTScan	Detection of Parkinsonism Syndrome	4 hours (1 hour scan)	Potassium Iodide capsules administered.

SCAN	BREIF DESCRIPTION	TOTAL PROCEDURE TIME	PREPARATION
Certain medications to be ceased			
Octreotide Scan	Neuroendocrine tumour and carcinoid localisation	3 days	No preparation.
White Cell Scan	IBS, localise infection (PUO or post prosthesis)	2 days	No preparation.
Lung V/Q scan	Detection of Pulmonary Embolism	1 hour	No preparation. Recent Chest X-ray required.
Lymphoscintigraphy	Assess Lymphatic drainage in limbs, lymphoedema	3 hours	No preparation.
MAG3 Indirect Cystogram	Assess Vesico-ureteric reflux	1 hour 30 mins	Drink 1 litre of water, 1 hour prior to scan.
Meckles scan	Localisation and detection of Meckles diverticulum	30 mins	Fast for 4 hours prior to scan. Patient to take Cimetidene prior to scan.
MIBG	Neuroendocrine tumour localisation	3 days	Potassium Iodide capsules administered.
Myocardial Perfusion Study	Assess the blood flow to the left ventricle in patients with suspected CAD	2 days	Special preparation regarding food and medication to be given.
Parathyroid scan	Localisation of parathyroid adenoma	3 hours	No preparation.
Salivary gland scan	Assess function and drainage of parotid and submandibular salivary glands	30 min	No preparation.
SeHCAT	Assess for bile salt malabsorption in patients with diarrhoea	7 days	Cease certain medications, no other radiological examinations in the week before and during the scan.
Renal DMSA scan	Split renal function in patients with History of UTI's and renal scarring	4 hours (45 min scan)	Stay well hydrated after injection.
Thyroid uptake scan	Assess size, location and function of the thyroid gland	1 hour	No CT within 6 weeks.
Thyroid medication to be discussed with technologist			
I-131 Thyroid therapy	Treatment of thyrotoxicosis	30 min	Thyroid scan prior.
Medication to be discussed with technologist			
Ra-223 therapy	Palliative treatment of prostate bone metastasis	30 min	Refer to oncologist.